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Circular Letters:



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The Role of Pleuropneumonia-Like Organisms in Genitourinary and Joint Diseases: Organisms belonging to the pleuropneumonia group (L organisms - as designated by Klieneberger) were first cultured from the human genitourinary tract in 1937 and have been recovered from this tract by several investigators since that time. No disease in human beings has yet been ascribed to such organisms, although they are known to cause important epizootic diseases in animals. This paper presents further observations on the incidence of these micro-organisms in human beings, with a discussion of their pathogenicity.

Whatever their source, all strains of the pleuropneumonia group of organisms are closely similar in the appearance of their colonies, in morphology, in staining, and in physical properties. The bovine, goat, and rat strains are pathogenic and produce well known diseases. The mouse strains, usually harmless saprophytes, are pathogenic if introduced artificially into mice. All pathogenic strains produce diseases that tend to be chronic. Although the primary localization of the process varies, joint involvement is common in all species of animals. Usually there is a migratory polyarthritis that subsides entirely within a few weeks, but occasionally the joint involvement is more severe, with suppuration and subsequent destruction of articulating surfaces and ankylosis. In mice, intravenous injection of one type of pleuropneumonia organisms (Type B) has been found to produce a chronic, proliferative process leading in many cases to ankylosis of the involved joints in from 2 to 5 months.

Organisms of the pleuropneumonia group can be recognized only by culture. Identification cannot be made in microscopical preparations from lesions since the organisms are usually not visible in stained preparations and are not sufficiently characteristic in dark-field examination. Because the human strains are not pathogenic for laboratory animals, they cannot be recognized by animal inoculations. Cultures, however, are characteristic. Many human strains grow well on mediums used for cultivation of gonococci, provided the mediums contain animal or human serum. The authors have obtained the best results with sedimented boiled blood agar to which 30 percent ascitic fluid or 20 percent human serum has been added. Anaerobic conditions are necessary for many strains. The colonies are well developed in 2 or 3 days. Sometimes they are macroscopically visible as pin-point colonies, but often they are only from 10 to 20 microns in diameter and can be recognized only in microscopical preparations.

The methods of anaerobic culture and stained agar preparations used in the present study have made possible the detection of pleuropneumonia-like organisms in many cases of genitourinary-tract infection in males in which the organisms would otherwise not have been recognized. These methods have been important also in differentiating pleuropneumonia-like organisms from pleomorphic forms of other bacteria.

The pleuropneumonia-like organisms that are cultivated from human beings and that have no apparent relation to other bacteria are characterized at present

only by their morphologic and physical properties. It is probable that they do not belong to a single species but represent many strains, which, like the mouse strains, are different in pathogenic action and serologic properties. However, the properties useful in differentiating strains of morphologically similar bacteria, such as growth requirements, metabolism and pathogenicity, are not known in these organisms. The cultural differences observed by the authors, which may or may not represent differences between species, are variation in appearance and size of colonies and difference in adaptation to artificial mediums. Organisms obtained from the female genital tract can usually be cultivated without difficulty. The colonies reach a relatively large size (from 0.1 to 0.5 mm.) and grow easily in transplants. Culture from males is more difficult. In several male patients with severe inflammation of the genitourinary tract, the organism grew only anaerobically. The colonies remained very small (from 0.01 to 0.05 mm.) and in transplants the organisms either did not grow or died out in two or three subcultures. The culture method used by the authors is presumably not appropriate for all strains, and with this technic they probably do not succeed in growing the organism from all specimens in which it is present.

Little is known about the serologic properties and pathogenic activity of the human strains, although some serologic differences between strains have been demonstrated.

In human beings the pleuropneumonia-like organisms were discovered first in the female and later in the male genitourinary tract. Material from various other sources, including secretions from the respiratory tract and conjunctiva, pleural, synovial, and spinal fluids, and stools, has been examined with similar methods, but, in the absence of penicillin, all cultures have been negative for pleuropneumonia-like organisms with the exception of synovial fluids from 2 patients with Reiter's syndrome discussed below.

After the discovery of pleuropneumonia-like organisms in an abscess of a Bartholin's gland in 1937, a study was undertaken to determine the incidence of these organisms in the human genitourinary tract. All routine genitourinary specimens sent to the bacteriologic laboratory over a period of three months were examined for this group of organisms. The specimens were, in most cases, submitted for examination for gonococci and were planted immediately by the physician taking the specimen on 30 percent ascitic-fluid-infusion agar plates containing 1-percent neopeptone and 2-percent boiled horse blood. This series included 214 specimens from the uterine cervix and 8 from the vagina, urethral discharges from 4 female patients, purulent material from 18 patients with suppurative processes connected with the female genital tract, 60 prostatic secretions, and purulent discharges from 11 male patients with urethritis. A pleuropneumonia-like organism was present in 26 percent of the cervical cultures of the above series. It was also found in the suppurative processes originating from the female genital tract but in a lower proportion of cases.

The relatively high incidence of this organism in the female genital tract suggests that it is part of the bacterial flora in this location. However, its presence in suppurative processes suggests that it occasionally has some pathogenic action in the female genital tract. Since the original series of unselected cases was completed, the authors have searched for a pleuropneumonia like organism in various types of inflammation of the female genitourinary tract and have obtained further suggestion of its pathogenicity. They have cultivated the organism from Bartholin's abscesses in 6 cases and from a pelvic abscess associated with puerperal infection and from one associated with salpingitis. The organism was associated with other bacteria except in 2 cases of Bartholin's abscess. In 6 cases of acute and chronic vaginitis and cervicitis the organism was present in pure culture and in 17 other cases was found in much greater abundance than other bacteria. In some of these cases the acute inflammatory condition developed a few days after sexual exposure. Such observations lend support to the hypothesis that the organism is pathogenic under certain conditions and indicate the necessity for further studies of its role in inflammatory conditions of the female genitourinary tract.

In male patients the incidence of pleuropneumonia-like organisms in the genitourinary tract is much lower than that in females. In the original series of routine cultures discussed above, the incidence in males was 8 percent.

This difference in incidence of these organisms in the male and female genitourinary tracts has also been apparent in the many cultures, taken during and after gonococcal infections, examined since the original series of unselected specimens was completed. These specimens have also afforded opportunity to determine the frequency of association of gonococci and pleuropneumonia-like organisms in the genitourinary tract. In cultures from female patients the two organisms were often found together. In the original series this organism was found in association with the gonococcus in 11 female patients, and in the 5 cases followed, the organisms remained in the cervix after the gonococci had disappeared. In male patients, on the other hand, none of the 6 cultures that showed gonococci was positive for the pleuropneumonia-like organism.

A study of the male patients from whom positive cultures for pleuropneumonia-like organisms were obtained gave more definite evidence of the pathogenicity of these organisms than that in the female patients. The organisms have been found in 58 male patients, including the 6 cases in the original routine series. All had evidence of prostatitis or other genitourinary-tract infection at the time of the isolation of the organism. In one patient these organisms were first cultured from the prostate during an acute attack of urethritis, arthritis, and iritis. Eighteen months later cultures of the prostatic secretion were negative for pleuropneumonia-like organisms. However, during an attack of urethritis, arthritis, and conjunctivitis, apparently precipitated by prostatic massage, an abundant growth of these organisms in pure culture was obtained from the prostate. In 12 cases the pleuropneumonia-like organisms were grown in pure culture. Six of these patients had cystitis. Another had a periurethral abscess. In the 4

cases of cystitis in which follow-up was accomplished, the organisms disappeared or decreased markedly in number after the urinary symptoms subsided. These data offer strong evidence that the pleuropneumonia-like organisms were the cause of the urinary-tract infection.

These 58 cases in males are divided into groups according to the clinical manifestations, which presumably represent the various types of cases resulting from infection with pleuropneumonia-like organisms.

Ninety percent of the male patients with pleuropneumonia-like organisms were between the ages of 20 and 40. In all groups the severity of involvement varied greatly. In 26 cases the infection was limited to the urethra and prostate without cystitis, arthritis, or conjunctivitis. The evidence of urethritis varied; in approximately a third of the cases only a slight discharge (or slight burning on urination) lasting a few days or months was present, whereas in the remainder a moderate or profuse purulent discharge persisting for months or even years occurred. One patient had a periurethral abscess of two days' duration. Similarly, the prostatitis was manifested in a third of the cases merely by slight change in the size and consistence of the prostate and a few white cells in the secretion, but in others the gland became large, boggy, and tender, and massage produced purulent secretion. In 5 cases pure cultures of pleuropneumonia-like organisms were obtained from the urethral secretions. In most of this group there was no evidence of systemic involvement, but 2 patients had an erythematous maculopapular rash.

In 9 cases the infection involved the bladder. Symptoms in these patients varied from slight dysuria and frequency in 2 cases to severe pain or gross hematuria in the remaining 7. Severe hemorrhagic cystitis was demonstrated by cystoscopy in 4 cases. The urine yielded abundant growth of pleuropneumonia-like organisms in pure culture in 6 cases and was associated with a few colonies of diphtheroids, staphylococci, Escherichia coli or streptococci in the others. In a higher percentage of these patients with cystitis (8 of 9 cases) than in those with uncomplicated urethritis and prostatitis, the infection persisted for many weeks. In 3 cases it recurred frequently over the course of several years. It is in this group that the effect of streptomycin therapy was most impressive, as pointed out below. Evidence of systemic involvement was present in only 2 of these patients. They had the characteristic picture of Reiter's syndrome and are discussed in that group.

The presence of constitutional symptoms (fever, chills, and malaise) and joint involvement in many of the male patients with positive cultures for pleuropneumonia-like organisms suggests that these organisms produce a generalized infection with joint localization. Arthritis was present in 27 cases, but the type varied considerably. They can be divided into patients with subacute or chronic

joint involvement (9 cases) and those with disease resembling infectious arthritis in the acuteness of onset, the tendency to migration and the degree of pain, tenderness and heat of the involved joints (18 cases). The group with acute cases can be further subdivided into 9 patients without eye involvement and 9 patients with conjunctivitis or iritis who presented the typical picture of Reiter's syndrome.

In the group of patients with chronic joint involvement, the evidence of urinary-tract infection antedated the onset of the arthritis in all but one patient, a 69-year-old man with typical rheumatoid arthritis of 33 years' duration. The joint symptoms in this group consisted usually of stiffness, aching, and slight swelling that persisted for months or years. It is impossible to determine whether there was any relation between the joint involvement and the urinary-tract infection in these cases.

The joint involvement in the group of acute cases was usually sudden in onset, polyarticular and often migratory. In 6 cases it was associated with fever and malaise, and in 2 cases with chills. Two patients had skin rashes, maculopapular in one and vesicular in the other, and another had balanitis. The affected joints were usually swollen, very painful and tender and occasionally somewhat reddened. The effusions usually persisted for long periods, often for months. In these effusions, the total leukocyte and polymorphonuclear cell counts were lower and the sugar contents higher than those found in comparable cases of infectious arthritis due to pyogenic organisms. Similarly, the mucin precipitated with acetic acid formed a tighter clump in most of these fluids than in effusions from other types of infectious arthritis. Despite the evidence of rather severe inflammation given by the synovial-fluid findings, the only roentgenographic change observed to date was moderate decalcification of the bones around the involved joints.

The clinical picture in 9 patients in the group of acute cases was characteristic of Reiter's syndrome, consisting of urethritis, arthritis, and conjunctivitis. The genitourinary and joint involvement resembled that in other cases of acute arthritis. The conjunctivitis was usually moderately severe, often with purulent discharge and persisting for one or two weeks. In 2 cases there was only slight redness, burning, and discharge lasting one or two days. Iritis was present in 2 of the cases, but no patients had corneal ulcers. Balanitis, consisting of superficial papulovesicular or ulcerated lesions, was noted in 5 patients. Stomatitis was present in 2 of these. Three patients had generalized skin lesions, maculopapular and vesicular. Aspiration of vesicles on the plantar surface of the foot in 2 of these cases yielded amorphous material, cultures of which were sterile. Like the patients with uncomplicated urethritis and prostatitis due to the pleuropneumonia-like organisms, the patients with Reiter's syndrome showed a tendency toward recurrence of the disease, 5 out of 9 having recurrences.

Until further information is available concerning the pathogenicity of the various human strains of pleuropneumonia-like organisms, it is difficult to

conclude whether or not the conditions produced by these organisms are contagious. Certain findings suggest that they are. The wives of 5 of the men from whose prostates pleuropneumonia-like organisms were cultured were studied, and in 2 cases these organisms were found in the cervical cultures. In one case acute arthritis developed in both husband and wife soon after marriage. Beveridge, Campbell, and Lind cultured pleuropneumonia-like organisms from 3 of 11 women from whom men had contracted nonspecific urethritis. The fact that the genitourinary, joint, or eye symptoms in at least 7 of the men with positive cultures in the present series developed within a few days after sexual exposure suggests that the disease is contracted in that way in some cases. However, in many cases no history of exposure was obtained. The possibility that the gastro-intestinal tract was the portal of entry in some cases is suggested by the fact that at least 6 patients had diarrhea just before or at the onset of the disease.

The treatment of diseases produced by pleuropneumonia-like organisms is still in an experimental stage. In rats and mice these diseases have been shown to be prevented or effectively treated in a high percentage of cases by gold compounds and by streptomycin. Penicillin has not been effective in animals. Pleuropneumonia-like organisms are not sensitive in vitro to sulfonamides or penicillin, but the growth of some strains has been found to be inhibited by streptomycin in a concentration of 20 micrograms per cubic centimeter. In the present series gold was used in only one patient and was ineffective. None of the patients treated with sulfonamides or penicillin showed any improvement in the genitourinary or joint symptoms. Streptomycin was used in 8 patients in whom the infection was limited to the genitourinary tract, including 4 patients with cystitis, in one patient with acute arthritis associated with urethritis, and in 5 patients with Reiter's syndrome. In 7 of the 8 cases of genitourinary-tract infection there was rapid disappearance of symptoms during treatment, and cultures became negative for pleuropneumonia-like organisms. In the eighth case in a patient who had had urethritis for 16 years, only a transient improvement in symptoms was shown, and the pleuropneumonia-like organisms did not disappear from the urethral cultures. In the patients with acute arthritis or Reiter's syndrome, there was improvement in symptoms during and immediately after treatment. However, evidence of joint inflammation persisted for weeks, and the sedimentation rates remained elevated. In none of the cases were pleuropneumonia-like organisms cultured after treatment. The results of streptomycin therapy were not conclusive but indicate that the drug is probably effective in most cases of uncomplicated genitourinary-tract disease due to pleuropneumonia-like organisms. In Reiter's syndrome the results were sufficiently suggestive to warrant further trial of this therapy.

In evaluation of the evidence gathered to date it should be remembered that some strains are presumably not recovered by the present methods, and that the strains isolated probably belong to more than one species and differ in their pathological significance. The fundamental biologic study of the organism

obtained from human beings is still in a primitive stage. The cultural methods, which at present are the only means of recognition, are probably inadequate. Attempts are now being made to develop biologic methods, such as serologic and skin tests. The need for a more detailed study of the properties of the various strains, especially their serologic characteristics and their pathogenicity, is indicated by the observations that attest to their ability to cause disease in human beings.

Further difficulty in evaluating the role of pleuropneumonia-like organisms arises from the fact that some of the bacteria commonly found in human beings grow in a pleuropneumonia-like variant form under certain cultural conditions, as in the presence of penicillin. Because of this difficulty, the 8 male patients with severe urinary-tract infection in whom pleuropneumonia-like organisms were found only after the growth of other bacteria was suppressed either by addition of penicillin to the medium or by treatment of the patient with penicillin or streptomycin have not been included in the present series. It is impossible to assess the significance of the pleuropneumonia-like organisms in these cases. It seems probable that they represent one of the many organisms that together cause the urinary-tract infection. However, they may be variant forms of the other bacteria present in the inflamed urinary tract. (New England J. Med., 8 and 15 April '48 - L. Dienes et al.)

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Effects of Radioactive Sodium on Leukemia and Allied Diseases: Radioactive sodium has not been used extensively in the therapy of generalized neoplastic disease, primarily because it does not tend to be concentrated in the regions of rapid growth as does radioactive phosphorus. The results with radioactive phosphorus, however, indicate that the localization is not sufficient to permit complete destruction of the pathologic cells without damaging adjacent normal cells. Also, the conclusions in recent reviews are to the effect that although $P^{32}$ appears to be an excellent therapeutic agent for polycythemia vera, and its effects on chronic leukemias are about the same as with roentgen therapy, some conditions (Hodgkin's disease, lymphosarcoma, reticulum cell sarcoma, and multiple myeloma) do not respond as well as to roentgen rays. It is also indicated that $P^{32}$ therapy, as well as roentgen radiation, is unable to effect control in cases of acute or subacute leukemias. Unfavorable reactions that sometimes occur in radiophosphorus therapy are production of leukopenia, thrombocytopenia, anemia, and aplasia of bone marrow. Since there is considerable variation in the susceptibility of different subjects, dosage must be individualized to a high degree. It is necessary to study the condition of the blood at frequent intervals so that administration can be stopped before irreversible toxic effects on the bone marrow are produced.

Compared with the difficulties in the administration of $P^{32}$, radiosodium offers some possible advantages. The irradiation from a single dose of $Na^{24}$ is not as prolonged (half-life is 14.8 hours) as from $P^{32}$, and it is therefore

easier to regulate the dose and frequency of treatment to fit the immediate and individual need of the patient. Also, the excretion of $Na^{24}$ is not as great or as variable as $P^{32}$. Although the $P^{32}$ uptake of some tissues is rapid, the more desired localization within growing cells is not appreciable until several days after the administration. By this time, a considerable amount of general radiation has been delivered, and the total $P^{32}$ content has been reduced by elimination and decay. Because the beneficial response of leukemias to radiation is due to the greater radiosensitivity of the abnormal cells, radiosodium therapy should produce beneficial effects even though its distribution is general.

Radiosodium therapy has some advantage over the usual roentgen treatment in that it includes the entire body, is protracted over a two-day period, and the radiation is relatively more intense in the blood and other body fluid. The gamma radiation of the $Na^{24}$ provides general irradiation whereas its beta radiation produces a more localized treatment of organs containing larger amounts of body fluid.

The possibility of using radiosodium in the therapy of leukemias was first investigated by Hamilton and Stone in 1937. In 1944 the authors began their investigations in which 31 patients have been treated, of whom 24 are reported upon in this article.

In this study, because of the penetrating radiation emitted by the radiosodium, it was necessary to use heavy lead protective shielding. Precautions were taken so that the exposure to personnel was always well below 0.1 r per eight hours. The radiosodium was administered by mouth as a solution (less than 1 percent) of sodium chloride. It was given in two or three small lots, from 10 to 15 minutes apart, and was followed by an equal volume of water in order to rinse the mouth, etc.

No rigid plan of treatment was adhered to other than an attempt to reduce the symptoms by a series of treatments and to give an occasional dose thereafter as indicated. The first treatment was considered as a test dose and was usually less than 180 microcuries per kilogram of body weight. Subsequent doses were regulated according to the need and sensitivity of the individual.

Blood counts were done every few days after the first dose and if there had been no response in a week or two, the treatment was repeated. A complete blood count was done before each treatment and the blood was checked a week later.

The first patients on whom radiosodium therapy was used were: a patient in the terminal stage of Hodgkin's disease, 3 patients in the terminal stage of lymphosarcoma, and a patient in the terminal stage of myelogenous leukemia. All of these patients were not being benefited by further roentgen therapy. Only a few small doses of radiosodium were given because these patients were in a

critical condition. The unfavorable trend was not stopped, but each treatment was followed by relief of pain and temporary regression of symptoms. Efforts at first were concentrated on the treatment of chronic leukemias in order to have objective and quantitative criteria (changes in the blood) for use in estimating the relation between dose and effect.

From the results obtained it appears that the use of radiosodium is an effective means of giving protracted irradiation to the whole body. The method appears to be adaptable in chronic myelogenous leukemia, chronic lymphatic leukemia, polycythemia vera, and in other generalized radiosensitive diseases.

It may be that at least some of the effect of radiophosphorus is not due to differential concentration of the $P^{32}$ alone because its general reaction in leukemias, etc., can be duplicated by radiosodium, the radiation of which is definitely widespread throughout the body.

The rapidity and degree of response, as well as the duration of the regression, can usually be regulated by the amount of each dose of radiosodium and the frequancy of treatment.

It has been possible to obtain very satisfactory responses in every individual treated with radiosodium without producing radiation sickness. Some slight nausea for a few days followed heavy and frequent treatment in 2 patients. The protraction of the irradiation may account for absence of radiation sickness in both radiosodium and radiophosphorus therapy.

There seems to be no complication nor lack of response due to giving the radiosodium by mouth. This method of administration avoids some of the complications and limitations of intravenous injection as used by some in radiophosphorus therapy and by Thygesen et al. in radiosodium treatments.

The use of radiosodium cannot, right away, become widespread because it is limited to laboratories near the source of supply (its half-life is only about fifteen hours). The investigation is being continued in the hope of learning more about its effectiveness not only in treatment of chronic leukemia, etc., but possibly in other forms of neoplasia which might be too widespread for proper treatment with roentgen radiation, and which might need a shorter period of more intensive irradiation than one could afford to give with radiophosphorus because of its longer half-life (fourteen days).

The limited data permit only tentative conclusions. Radiosodium, taken by mouth, in a suitable quantity and at appropriate intervals, is effective in reducing symptoms of chronic myelogenous leukemia, chronic lymphatic leukemia and polycythemia vera. The rate of response to each treatment appears to be intermediate between that of roentgen therapy and treatment with radiophosphorus.

The response to radiosodium therapy is not good when (1) the disease is acute, (2) the radioresistance of the abnormal cells is high, and (3) the hemopoietic system is already damaged. The contraindications are similar to those for other forms of radiation therapy. (Am. J. Roentgenol., April '48 - T. C. Evans et al.)

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Repair of Fascial Defects with Whole Skin Grafts: The presence of fascial defects has presented a difficult problem to the surgeon. Lack of abundance and the difficulty of procurement of fascial tissue suggested a search elsewhere for a substitute tissue that would possess several characteristics peculiar to fascia and in addition be more readily obtainable, stronger, if possible, and more amenable to transplantation. The new tissue should have a good blood supply in contradistinction to the avascularity of fascia in order that a "take" would be insured in a high percentage of cases.

It was concluded that the dermal-fat graft or the dermal graft had the desired characteristics for the substitute tissue. Skin is easily obtainable in large quantities, easy to handle, about as strong as fascia and freer from complications.

The technic of obtaining the dermal graft more or less depends upon the existing defect that is to be repaired. However, there are certain general procedures that are applicable to the technic of obtaining any of the grafts. The preoperative preparation of the donor skin must be meticulous and should be carried out over a period of 48 hours. The area is carefully shaved and scrubbed with green soap, water, and a brush for a period of ten minutes. The soapsuds are then rinsed off with warm sterile water. Seventy-percent alcohol is applied. This is followed with ether. The area is then draped with a sterile towel which is held in place with a bandage. It has been found that mercurial antiseptics should not be employed in the preparation of skin that is to be used for grafting. The above procedure is repeated the next day and again at the operating table. After the patient has been draped and the recipient site has been prepared, the initial .015 or .016 of an inch of the superficial skin, which includes the stratum cornium and a portion of the stratum granulosum, is removed by a Blair knife with attachment or a Paggett dermatome. The author prefers the use of the dermatome. The remainder of the dermis and the desired subdermal tissue is then excised according to the required pattern. The linear shrinkage of approximately from 20 to 25 percent must be taken into consideration when the pattern is laid out. The depth shrinkage may be as great as from 50 to 60 percent which is discernable only after from two to three weeks after the placement of the graft. This shrinkage in depth is directly proportional to the amount of fat that has been included with the graft.

The defect in the donor area is closed by undercutting of the edges and by the use of retention sutures. It has been found that the deep Halsted type of

retention sutures are most satisfactory. If the graft has been a large one, it may be necessary to roll the subcutaneous tissue into the defect after the undercutting has been carried deeper and toward the deep fascia. If the skin is under much tension, a complete closure with the retention sutures should not be attempted. After a partial closure has been made with the retention sutures the remainder of the skin defect may be covered with the split-thickness graft that was originally removed before the dermal-fat graft was raised. The author has employed cotton sutures throughout, No. 100 for bleeders and non-tension suturing, and No. 36 for retention sutures. All surfaces are anointed with a thrombin solution. The split-thickness grafts are retained with Zeno adhesive or a modification thereof. They are never sutured. The use of any adhesive of this type necessitates a completely dry field. If the split-thickness graft has been permitted to remain on the drum, there is no need for the use of saline, and the graft will be dry when it is applied. A light coat of warmed sulfathiazole ointment 5 percent is brushed over the graft or the area of closure. A sterile gauze dressing is applied and covered with sterile cellophane or wax paper. Fluffed gauze or mechanics waste is bandaged or strapped in place for pressure. This dressing is left in situ for from ten days to two weeks unless the odor or a drainage suggests otherwise.

The technic of application of the dermal or dermal fat graft depends upon the requirements of the defect to be repaired. In all cases thrombin solution is used to anoint all of the contacting surfaces. The dermal edges are sutured to the freshened edges of the fascial defect. No attempt is ever made to fix the fat. A pressure dressing similar to that described above is also employed.

The facility with which the dermal-fat grafts may be handled is surprising to the surgeon who has not employed this type of graft. The percentage of successful takes is high if absolute asepsis is maintained and the graft is carefully sutured in place.

Muscular herniations through the fascial defects of the extremities present a problem that pure fascial grafts do not successfully answer. Naturally smaller defects in the deep fascia, such as those occasionally seen lateral to the anterior crest of the tibia, may be caused when plicating the fascia with sutures. However, there may be much tension created unnecessarily. There is usually a loss of subcutaneous tissue which is considered due to the pressure of the muscle that has herniated through the fascial defect. If the rupture is small, the superficial defect is readily obliterated by sliding the edges together with undercutting of the edges and using retention sutures. However, if the defect is a large one, it is preferable to introduce the dermal-fat graft placed upside down.

This method has been employed in seventeen cases of muscular herniation in the extremities and other soft tissue defects of the extremities involving the deep fascia. Three of these cases were apparently congenital fascial defects since it was impossible to obtain a history of trauma either new or old. The remaining fourteen cases were definitely post-traumatic fascial defects (lacerations, gunshot wounds, etc.) with and without hernia.

Fascial defects of the abdominal wall in thirty cases have been repaired with the use of the dermal-fat graft. These fall into two groups; the repair of hernias and the initial repair of fresh defects.

Ventral hernia, which is most frequently a postoperative (incisional) hernia, presents a large defect in the fascia which must be closed by the proximation under tension of the more or less attenuated fascial edges or closed by the introduction of new or transplanted tissue. If the defect is very large, it is nearly impossible to effect a solid and satisfactory closure without the introduction of a graft of tissue, the use of which eliminates the tension factor.

Dermal or dermal-fat grafts have been employed to repair initial abdominal wall defects with which there were associated fascial defects.

Several inguinal hernias have been repaired with the aid of strips of skin used to fortify the fascia or by actual dermal grafts. It is believed that an unusually strong repair may be effected in the direct inguinal hernias when the conversion of the direct hernia to an indirect hernia has been effected and the floor of the canal fortified by a graft of dermal tissue. The remainder of the repair may be completed by any of the accepted procedures.

This method of fascia repair by dermal or dermal-fat graft is simple, certain and dependable. (Am. J. Surg., May '48 - W. A. Swanker)

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Medullary Nailing in Recent Fractures, Pseudarthrosis, and Bone Plastics: Medullary nailing as a treatment of fractures of the long bones was originated by Küntscher, of Kiel, Germany. In 1940, he published his first results with the new method. The author and co-workers have used this method in 100 cases from 1943 to 5 January 1946 on the Surgical Service of the Sahlgrenska Hospital, Gothenburg, Sweden. The results have been encouraging. The aim of medullary nailing is to keep the bone fragments in position by means of a long nail inserted into the marrow cavity. Because the nail is driven in from a hole chiseled in the cortex far from the site of the fracture, the reduction is not an open one. The nail is V-shaped and does not fill the whole marrow cavity and, thereby, causes very little damage to the bone marrow and the endosteum. The nail contacts the endosteum only in three narrow places, as shown in Figure I on the following page, and because it is comparatively thin (1.5-2 mm.), it causes only a moderate compression of the marrow. Through its angulation and the hardness of the steel, the nail, in spite of its thinness, is very resistant to flexion, and if it fits well into the marrow cavity, it effects a firm fixation.

In fractures of the femur the nail is inserted from the upper surface of the trochanter major, either percutaneously or through a small incision. No chiseling is needed because the bone here is very soft. When inserting the nail into the other long bones, such as the humerus, radius, ulna, or tibia, a small hole

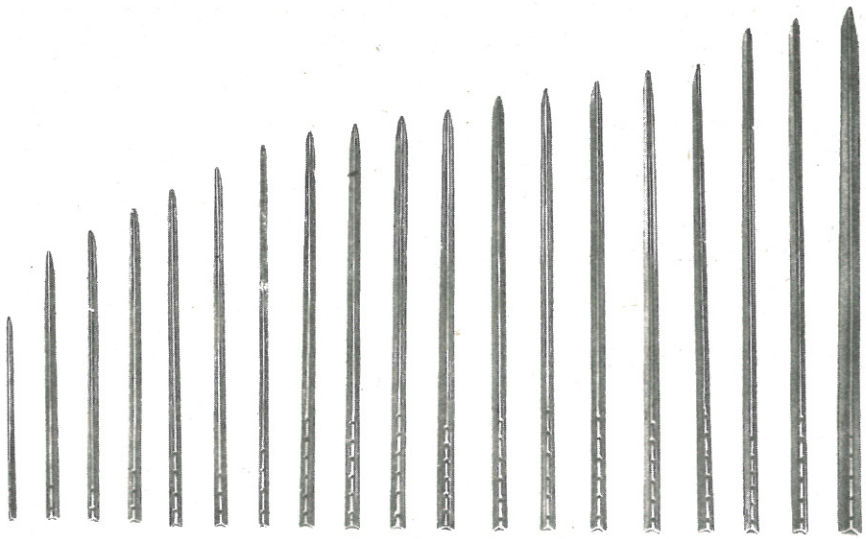


FIG. 1.—(a) Medullary Nails. (b) (Below) showing detail of design and cross-section of nail *in situ*.

a

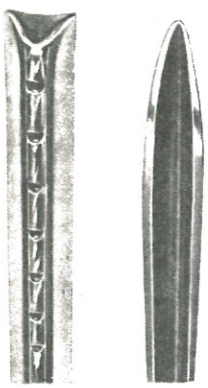


FIG. 1b

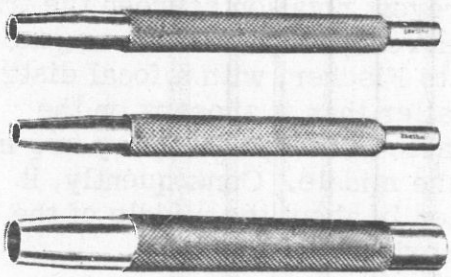
must be chiseled or bored through the cortex at a suitable distance from the site of the fracture.

The difficulty is to get such a good closed reposition that the nail can be inserted from one fragment directly into the marrow cavity of the other. Several apparatuses for facilitating this reposition have been constructed. Kuntscher attaches great importance to the closed reposition since exposure of the fracture site and open reposition involve risk of infection. However, today with penicillin, this risk is slight. As this series of cases shows, it is sometimes necessary to use open reposition. If the closed reposition is successful, the medullary nailing is only a small operation, which causes the patient slight strain and little risk.

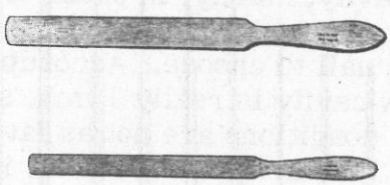
The nail must be inserted under fluoroscopic supervision, or checked by serial roentgenograms. The latter method has been found satisfactory by the author. In order not to risk having to take out the nail and change its position, a "leader" (Kirschner needle) may be inserted first; this is done in operations on fractures of the femoral neck.

The author and associates used nails made of rustless steel manufactured by Ericsson's Instrument Company, in Gothenburg, Sweden. The first nails used, however, were not sufficiently strong and were bent at the site of insertion or later through the strain of the fracture. The new ones are more satisfactory.

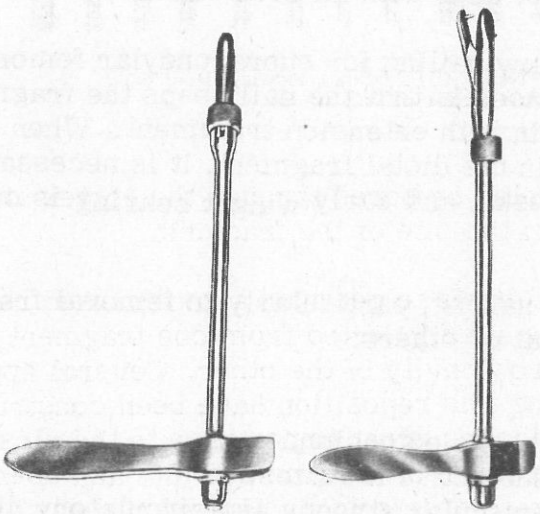
The nail must not, however, be manufactured of too hard steel, which would prevent the flexion necessary to insert the nail into the marrow cavity from the small hole in the cortex. The instruments needed are very simple as shown in Figure 2. It is necessary to have a good apparatus to withdraw the nail if it



Driver.



Striking Tool.



Nail-drawing instrument.

Fig. 2 - Instruments used in medullary nailing

happens to lie in a wrong position and after healing of the fracture. It is also necessary to have several nails of different lengths (from 10 to 45 cm) and widths at hand.

The table below shows the types of the 100 cases in this study:

It is extremely important to the healing of the fracture that absolutely firm fixation be obtained in medullary nailing. For this, a nail which fits well into the marrow cavity must be chosen, and it must be ascertained that the latter is of fairly

| | Recent Fractures | Pseud-arthrosis | Bone Plastic | Totals |
|---|---|---|---|---|
| Femur | 13 | 6 | 3 | 22 |
| Tibia | 28 | 3 | 1 | 32 |
| Humerus | 15 | 13 | 3 | 31 |
| Radius or ulna | 12 | 1 | .. | 13 |
| Metacarpal | 1 | 1 | .. | 2 |
| | 69 | 24 | 7 | 100 |

even width. This is the case in the cavity of the femur and to a certain degree in the radius and ulna, but the tibia and humerus often have rather symmetrical marrow cavities. Thus, the best results are obtained in nailing of femoral fractures. The nail must be wide enough so that it establishes firm contact with the wall of the marrow cavity, mainly, in order to prevent rotation between the fragments. One can estimate from the size of the marrow cavity in the roentgenogram about what size nail to choose. According to Fischer, with a focal distance of 75 cm. the marrow cavity is really 1 mm. smaller than it appears on the roentgenogram. The conditions are not as favorable in the tibia as they are in the femur, for, here, the cavity is narrowest in the middle. Consequently, it is easy to obtain firm fixation of fractures situated in about the middle of the tibia but not of those situated more distally or proximally.

If full stability is not obtained with one nail, it is wise to insert another one. This needs to be done more often in the cases of bones with uneven medullary cavities (tibia and humerus) than of ones with an even canal.

Fischer recommends medullary nailing for supracondylar femoral fractures. The greatest advantage in these cases is that the nail keeps the fragments in position, which is difficult to obtain with extension treatment. When the nail can only be inserted from 3 to 4 cm. in the distal fragment, it is necessary to apply a plaster encasement for some weeks, and early weight bearing is out of the question.

The advantages of medullary nailing, particularly in femoral fractures, are, in the author's experience, and that of others:

1. Shortened stay in bed.
2. Simplified after-treatment - no extension.
3. Reduced pains and other subjective troubles.
4. Less risk of stiff joints, muscular atrophy and circulatory disorder.
5. Shorter hospitalization and probably earlier acquirement of working capacity.

No definite agreement has been reached about the indications for medullary nailing. Küntscher says that the method is suitable for all transverse, oblique, and spiral fractures of the long bones, and Pascher considers it absolutely indicated in all transverse, all oblique fractures with a poor healing tendency or in which there is risk of slipping, and in all fractures in old persons, when a long stay in bed should be avoided. Böhler, who is a strong opponent of open treatment for fractures, recommends the method for gunshot fractures, thus, open fractures, and seems to be a strong advocate of medullary nailing, on the whole. Others, for example K. H. Bauer, reserve the method for more special cases, e. g., those in which an open reduction becomes necessary.

Medullary nailing involves, of course, certain risks. The danger of bone marrow destruction, fat embolism, and osteomyelitis must be borne in mind

Experience has already shown that the damage which the nail causes to the bone marrow is of no or little practical significance. It is recommended, however, that the nail be removed when full consolidation is established. This has been done in the majority of these 100 cases. The removal of the nail is a simple operation. After a few months the nail generally lies fairly loosely in the marrow cavity. At least two deaths from fat embolism after medullary nailing are reported (Küntscher and Häbler). Detailed information is lacking, and it is impossible to decide whether the fat embolism occurred as a result of the fracture or of the nailing. Osteitis has developed in a few cases (Küntscher, Fischer, and others), in most of which complications were present before nailing. Extended osteomyelitis, generally, does not develop, but only restricted osteitis, with local sequestration, mainly due to the fact that the pus in the marrow cavity is led off by the nail. Thus, according to Küntscher, Böhler, and others, there is never any enclosure of pus in the cavity with rising pressure, which is generally considered to be the cause of extending osteomyelitis. Küntscher says that whenever there is infection, the pus should be drained off, but that the nail should not be removed since the fracture generally heals in spite of the infection. That is also the author's experience. If the nail is removed, the infection grows worse because the fragments no longer lie still.

The author has found that medullary nailing simplifies the pseudarthrosis problem considerably. The literature on this subject is still very scanty. K. H. Bauer, who otherwise is reserved concerning this method, recommends it in cases of pseudarthrosis, and so do Böhler and Cellarius, from Kirschner's Clinic, who report the results of 18 cases which were earlier treated in vain by other methods. In at least 15 of these cases bone healing took place within from 6 to 8 months after medullary nailing.

The author has used medullary nailing in 24 cases of pseudarthrosis with satisfactory bone healing in those which he has been able to follow for a sufficiently long time, except for 3 in which inflammation recurred after operation.

In order to hasten bone healing, medullary nailing may be combined with other operations, such as bone transplantation, either in the form of bone clips, according to Levander, or by covering the pseudarthrosis with a larger bone piece. Often, medullary nailing alone is sufficient.

In six cases, in which pseudarthrosis of the thigh bone had persisted for from one and one-half to three years, and in spite of attempts to obtain osseous healing with many different methods, it was a great mental relief to the invalids concerned to be rid of pain and be able to get up soon after the nailing. Two of them had almost continuously been confined to bed for two or three years. In these six cases, the nail was inserted from the upper surface of the trochanter, and before insertion the wound was revised, with excision of fibrous tissue and freshening of the bony ends. Because the fracture was exposed in these cases, it was not difficult to get the fragments into such a position that the nail came into the marrow cavity of the distal fragment. In two of the cases, persisting

fistulae with a slight discharge were present at the time of the operation. In one case the fistula healed soon after the operation; in the other there was still slight suppuration at the time the patient was discharged. In order to avoid the risk of reactivation of a latent infection sulfathiazole was introduced into the operative wound in all cases. After one or two weeks in bed the patient was allowed to get up. The prolonged stay in bed before the operation had produced more or less marked stiffness in the joints as well as muscular atrophy, necessitating intensive physical therapy.

Regarding the permanent results, in at least three cases out of the six, consolidation had developed before the patient was discharged. The three other patients returned home so early that the final results could not be judged. There is much to indicate, however, that osseous healing will take place in these cases as well, within reasonable time.

The most important condition for osseous healing is absolutely firm fixation of the fragments, which is obtained with medullary nailing, especially in cases of pseudarthrosis with sclerosed bone. Another important factor is early weight bearing, which may be started almost immediately after medullary nailing.

It is more difficult, in cases of pseudarthrosis, to do the nailing, than in cases of recent fractures. The sclerosis in the end of the bone offers powerful resistance and may even make it impossible to insert the nail. Thus, in one case, it was not possible to drive the nail through the strongly sclerotic bone (tibia), and medullary nailing could not be completed. The partially inserted nail was so firmly fixed in the bone that it could not be drawn out, and a piece of it had to be left there.

In the cases in which there is a question of shortening or lengthening of a leg, or to cover a deficiency of a bone, medullary nailing is very useful, especially because the nail gives stability to bone and transplantation. (Ann. Surg., April '48 - A. Westerborn)

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Iso-immunization with the A and B Factors and Its Relation to Hemolytic Disease of the Newborn: Soon after Philip Levine's epochal discovery of the role which the Rh factor plays in the pathogenesis of erythroblastosis fetalis, it was contended that antigens other than Rh also may be capable of inducing iso-immunization and that such iso-immunization may be responsible for some instances of erythroblastosis fetalis in which the Rh or Hr factors played no part in the pathogenesis of the disease. The following pertinent observations to date support this contention:

1. The demonstration by Hirszfeld and Zborowski, in 1926, and independently by Polayes (one of the authors of this article) et al., in 1927, that isohemagglutinins traverse the placental barrier from mother to fetus.

2. The demonstration of the antigenic properties of human blood by Jonsson in 1936.

3. The identification of an immune atypical intragroup hemolysin which was responsible for a transfusion reaction post partum in a group A mother delivered of a group B anemic infant, reported by Levine and Polayes in 1941.

4. The observation by Levine, in 1943, that a definite relationship exists between A-B-O iso-immunization and spontaneous abortion.

5. The observations and case reports by Polayes, Boorman et al., Kelsall, Halbrecht, Aubert, Wiener, and others, between 1942 and 1946, all indicating the possibility that the A and B antigens may induce iso-immunization in Rh-positive women, resulting in neonatal conditions very similar to, if not identical with erythroblastosis fetalis.

6. The statistical fact that most instances of erythroblastosis fetalis, occurring in infants born of Rh-positive mothers, occur with heterospecific pregnancies, noted by Levine, in 1943, and by Halbrecht, in 1944. The latter analyzed 10,000 births among which he found 60 cases of icterus which simulated mild erythroblastosis and which he called "icterus neonatorum precox." He made the striking observation that in 95 percent of these cases, the blood of the mother was incompatible with that of the offspring (heterospecific pregnancy). In marked contrast to this, in a comparable series of 2000 pregnancies which terminated with normal babies, he found only 26.5 percent incompatibility between mother and baby.

7. Finally, the observation by Polayes and others that mothers (Rh-positive or negative), whose heterospecific pregnancies result in erythroblastotic infants, show much higher isohemagglutinin titers than do mothers of normal babies. In fact, the high titer of the isohemagglutinins sometimes serves as an aid in prenatal blood group determination. The results of a study of such a series have been discussed in a previous publication.

In 1945, one of the authors called attention to a collection of 6 cases of erythroblastosis fetalis in which the Rh and Hr antigens were excluded as possible immunizing antigens, but in which the mothers, all of group O, showed high anti-A agglutinin titers in their serums. In one case with a fatal termination, postmortem examination showed the classic anatomic changes characteristic of erythroblastosis fetalis. The brain showed kernicterus, which, as previously reported, is almost a pathognomonic finding in hemolytic disease of the newborn. The other 5 patients suffered from a relatively mild form of the disease, although the anemia persisted even after the earlier jaundice had disappeared. The babies responded well to transfusions with blood of the same group as their own.

In conjunction with the clinical and pathologic study of these cases, simple experiments were carried out in which the bloods of approximately 50 consecutive

group-O nulliparas were examined for anti-A agglutinin titer. The average titer was found to be 1:58 (range from 1:20 to 1:100). In a series of 50 group-O mothers of normal group-A children, the average titer was found to be 1:215 (range from 1:120 to 1:300). These values were in marked contrast to the high titers of 1:710 (range from 1:700 to 1:750), obtained in the six group-O, Rh-positive mothers of erythroblastotic group-A infants. This difference in titer was considered to be significant of iso-immunization of the group-O mother by the group-A infant, by a mechanism similar to Rh iso-immunization. In summarizing that report, it was stated, that although more statistical data would be required to arrive at any conclusions, it was felt that (a) iso-immunization by the A and B agglutinogens may occur, and that (b) erythroblastosis fetalis may result from it, by a mechanism similar to that already established for the Rh factor.

Since then, others have reported similar cases with similar conclusions, as indicated above in the enumerated list of pertinent observations supporting the original contention of this article. The difference in the isohemagglutinin titers which was observed in the various groups (nulliparas, multiparas, and heterospecific pregnancies which terminated in erythroblastotic infants) tested in the earlier series, however, indicated the advisability of repeating the same study on a larger number of individuals.

The titer of the anti-A and anti-B isohemagglutinins was determined in 259 individuals, including children, nulliparas, primiparas, and multiparas, some of the women having compatible, and others, heterospecific pregnancies. Among those with heterospecific pregnancies were included mothers of infants with conditions closely simulating erythroblastosis fetalis, from which the Rh and Hr factors had been excluded as the immunizing antigens. The results seem to indicate that gestation, particularly when it is heterospecific, is associated with an increase in the isohemagglutinin titer, as compared to the titers found in children and in nulligravidas and primiparas with compatible pregnancies. The primiparas who showed any significant rise in the isohemagglutinin titers were those with heterospecific pregnancy. In general, multiparas as a group showed elevated titers, probably due to the fact that as a group, they were exposed to the possibility of repeated iso-immunizations through heterospecific gestation. The highest titers, however, were obtained in those women who had given birth to offspring with conditions very closely simulating and often, clinically and anatomically, indistinguishable from hemolytic disease of the newborn. The average titer in these cases was very much higher than in the other heterospecific pregnancies which resulted in normal babies.

The above findings confirm the earlier observations that the A and B antigens are capable of inducing iso-immunization in pregnancy and that neonatal disease, indistinguishable from erythroblastosis fetalis, may result therefrom. If the term hemolytic disease of the newborn is not acceptable for this group of babies, some other name will have to be given to it. The constant association of such high isohemagglutinin titers in the mothers of these infants identifies

them as a distinct group, and the antibody titer must have a particular and related significance, just as the Rh antibodies have in hemolytic disease of the newborn. The clinician is often unable to distinguish the condition of these babies from that resulting from Rh immunization. Often these babies are as gravely ill as the babies with Rh antibodies and with the same signs and symptoms. In some instances, the condition is also fatal and on postmortem examination these infants reveal the same anatomic changes which the fatal Rh cases show. The response to treatment is also similar to that shown by the babies with Rh antibodies.

The arbitrary and complete separation of erythroblastosis fetalis on the basis of immunization by one antigen only (Rh) has already proved to be fallacious. The role which Hr factor has been shown to play in the pathogenesis of erythroblastosis, is a case in point. Still other antigens may yet be uncovered which can play the same role. Although the Rh factor is admittedly, by far, the most frequent antigen involved in the pathogenesis of erythroblastosis fetalis, the results of the above investigations indict the A and B antigens as additional offenders. They may well be the immunizing antigens in the above mentioned group of neonatal diseases which so closely simulate hemolytic disease of the newborn due to Rh immunization as to make it impossible to differentiate them from that group. Therefore, until a more suitable name is found for this group, it seems advisable to consider it a variety of erythroblastosis fetalis. (Am. J. Clin. Path., May '48 - S. H. Polayes and J. McNally, Jr.)

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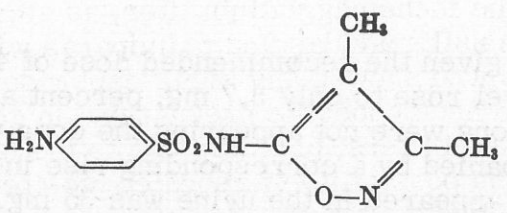
A Clinical Evaluation of Nu-445, a Recent Sulfonamide: Nu-445 is a recent drug of the sulfonamide group having this chemical formula:




3,4-dimethyl-5-sulfanilamido-isoxazole

The drug has been recommended as an effective agent against infections of the urinary tract by Gram-negative organisms (see Medical News Letter, 13 Feb. '48, p. 3). This study was undertaken to evaluate the efficiency of this preparation against such organisms.

Recently Sarnoff and others published the results of a clinical trial of Nu-445. They were interested only in the effect of the drug on the Proteus vulgaris which was present in every case with a variety of other organisms. The dosage varied from 50 to 112 Gm. in most instances given over a period

of 10 days. In their series of 14 cases they were encouraged by the fact that 11 were favorably influenced, and in 9 the Proteus vulgaris disappeared from the cultures.

In this study concerning a group of 20 patients with urinary infections treated with Nu-445, several points should be emphasized. First, this number of patients was small. Second, the study was not limited to any one group of bacteria but included all the organisms found present. Third, before treatment was begun an attempt was made to eliminate all possible sources of contamination. No patients who had indwelling catheters or in whom calculi were present were treated until such foreign bodies had been removed. Fourth, of the 20 patients studied, 19 were infected primarily with Gram-negative organisms, chiefly, Escherichia coli, Proteus vulgaris, and Pseudomonas aeruginosa, and one had a staphylococcus infection. In the last patient the Staphylococcus albus was eliminated but a nonhemolytic streptococcus appeared.

Before starting treatment cultures from the urine or wound were planted on blood agar and endo agar. The usual check was made of the urinary sediment, the hemoglobin, and the blood count. In addition, the infecting organisms from many of the patients were tested for their sensitivity to Nu-445 in vitro. Here it was found that the effectiveness of the drug was enhanced when the pH of the media was between 7 and 8. At this level growth of Ps. aeruginosa ceased at a concentration of 3.1 mg. percent of Nu-445, and at a pH of 5 a level of 6.2 mg. percent was necessary for bacteriostasis. For this reason the urines of all the patients receiving the treatment were made alkaline by sodium citrate. With the above figures in mind, however, it was apparent that a therapeutic urinary concentration of the drug could be maintained only by administering rather large doses of the preparation, since approximately 50 percent was excreted through kidneys.

Initially the patients were given the recommended dose of 4 Gm. daily, but when the blood sulfonamide level rose to only 3.7 mg. percent and it was apparent that severe toxic reactions were not appearing, the dose was increased to 8 Gm. This was not accompanied by a corresponding rise in the blood level. The highest concentration that appeared in the urine was 35 mg. percent. Later a group of 5 patients were given daily doses of 12 Gm. In all of these individuals there developed satisfactory urinary drug levels comparable to those observed by Schnitzer and his group.

Of 20 patients treated with Nu-445, seven were improved. Thirteen patients showed no benefit from the treatment. Among the patients whose infection improved during treatment those who received smaller doses of Nu-445 did as well as those who were given the drug in larger amounts.

Complicating factors occurred in 5 patients, but only 3 were unable to continue with the medication because of toxic symptoms. The elevation of temperature in one case forced the withdrawal of the drug, and in another patient erythema

developed. One patient could not continue with the drug because of nausea. Of the patients whose symptoms were not ascribed to the medication, auricular fibrillation developed in one on the third day, and a severe gastric hemorrhage occurred in the other on the second day.

In the group of 5 patients who received 12 Gm. of Nu-445 daily the authors wished to determine whether there was some correlation between the blood and urinary levels and the response of the infecting bacteria. A close inspection of the urinary levels showed that in 3 patients the amount of drug excreted in 24 hours exceeded the intake. Evaluation of this discrepancy is difficult, but it may be ascribed to a delayed renal excretion initially, followed by the clearance of an excessive amount of drug during the period the estimation was made. There seemed to be no relation between the blood or urine sulfonamide levels and the bacteriostatic properties of the drug.

A striking feature of Nu-445, and one which may be of considerable value, was its solubility. There was no instance of crystal formation in the urine. (J. Urol., April '48 - R. S. Rodgers and F. H. Colby)

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Prophylactic Immunization and Specific Therapy in Experimental Pneumonic Plague: There is extensive proof that the secondary pneumonia of terminating fatal bubonic plague can cause primary plague pneumonia in contacts and set off an epidemic of primary pulmonary plague through man-to-man transmission independent of the rodent and insect vectors.

The bacteria isolated from bubonic and pneumonic plague are identical, and nobody has been able to confirm an early hypothesis (Polverini, Martini, Connal) that the plague bacilli causing pneumonic plague have some special pulmonary tropism. In fact, experiments and epidemiological facts have demonstrated conclusively that whether one kind of plague or the other is produced by the invading agent depends entirely on the portal of entry. Theoretically, then, methods which have proved effective against infection transmitted through flea bites or the cutaneous portals of entry should be protective or curative against the invasion of the plague organism, Pasteurella pestis, via the respiratory tract.

The following conclusions resulted from experiments undertaken to secure information basic to the adoption of prophylactic and therapeutic procedures against human pneumonic plague:

1. The intranasal instillation of from 2,000 to 25,000 highly virulent plague bacilli produces in mice, guinea pigs, and cotton rats a primary pneumonia which is anatomically indistinguishable from that observed in man.

2. Active immunization with live avirulent strains of Past. pestis or chemically killed virulent bacilli in the form of particulate antigens confers on mice

a definite, and on guinea pigs, a marked protection against an intranasal challenge infection.

3. Concentrated antiplague rabbit serums possess prophylactic and, to a slight degree, curative values in pneumonic plague.

4. Sulfonamides are not very effective in experimental pneumonic plague. However, when combined with antiplague serum, their therapeutic value, definite in bubonic plague, is equally demonstrable in the pneumonic type.

5. Streptomycin is thus far the most effective therapeutic agent known for the treatment of plague infections, both bubonic and pneumonic. Over 90 percent of experimentally infected mice, when in the septicemic state of lobular plague pneumonia, may be cured with 5 mg. of streptomycin. It is recommended that in human pneumonic plague the treatment be started early in the course of infection with daily doses of from 4 to 6 Gm. of streptomycin, and that the treatment should be continued for not less than from 6 to 10 days. (Am. Rev. Tuberc., April '48 - K. F. Meyer et al.)

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Internal Strains in Acrylate Denture Base Materials: Internal strain is recognized as being present in all acrylic resin dentures. The presence of this strain is considered to be due to three possible causes: first, strain set up by polymerization; second, thermally induced strain occurring above the softening point of the particular resin; third, thermally induced strain occurring between this softening point and room temperature. The strain in the two latter cases is due to the different thermal coefficients of expansion of resin, plaster, porcelain teeth, and any metal which may be incorporated in the denture.

The presence of strain in a denture is quite harmless, provided that the denture remains at body or room temperatures or is not allowed to exceed its softening temperature. However, if the usual technic is followed for making repairs or additions, or for rebasing, it is necessary to raise the temperature above the softening point for the polymerization of new material into the denture.

Strain relief takes place at a point above the softening temperature and will occur, together with the accompanying distortion, during repair if the temperature during repair reaches this point, despite the fact that the denture may be firmly enclosed in plaster of Paris. The differences in the thermal coefficients of expansion of the components of the denture will cause some alteration in shape, and is considered to be sufficient to bring about the discrepancies in fit frequently encountered after repair. In addition, although the original strains may be "annealed" out of the denture by the temperature of repair, new strains will be induced by the cooling process associated with the repair. Also, it is thought that each time methyl methacrylate is reheated at 100°, there is a progressive linear shrinkage, which may account for the progressive discrepancies of fit that are found after repeated repairing.

Because of the absence of a practical method for annealing out the strains that develop during the original processing of acrylic resin dentures, a modification of the repair technic seemed desirable.

The approximate softening point of most acrylic resins is 80° C. ± 5° C. If the temperature inside the flask is not allowed to exceed 70° C. during the process of repair, strains will not be relieved, and the distortion that would result therefrom will not occur. Polymerization of the small mass of new material present in the average repair will, however, be initiated and rapidly completed.

Experiments showed that the temperature in the center of a denture flask reached 70° C. in ten minutes from the time it was placed in boiling water. Therefore, a curing technic was adopted for repairs. This consisted of placing the flask in boiling water for ten minutes and then removing and allowing it to cool to room temperature. The slow cooling permits complete polymerization before the flask is opened.

Numerous repairs were completed by this short-period, low-temperature cure, with entire elimination of errors in fit. Second or third repairs of the same denture were often unsatisfactory because of linear shrinkage. (Brit. Dent. J., 16 May '48 - J. Osborne)

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Coloring of Compound 1080: In furthering work on the coloring of compound 1080 for the Quartermaster Corps of the Army, studies involving the following were conducted:

1. The determination of the reaction of rats to a number of promising coloring materials.

2. The most effective method of coloring 1080 with a minimum of dye or pigment.

3. The effect of the dye or pigment on the toxicity of compound 1080.

4. The acceptability of aqueous solutions of colored 1080 to rats.

It was found that compound 1080 can easily and effectively be colored as the dry powder by the simple expedient of dissolving a dye or pigment in a saturated solution of 1080, recrystallizing, and grinding. Nigrosine Black (W.S.) dye, Brilliant Red B Extra (W.S.) dye, (now called Rhodamine B Extra), and Monastral Fast Green pigment used in a concentration of 1 percent by weight of coloring material to 1080 gives an effective color. A concentration of 1/2 of 1 percent by weight appears adequate with the Nigrosine dye. Compound 1080 colored as stated above, when employed in water at the rate of 1/2 oz. per gallon, produces

an effective colored water. Laboratory rats show no aversion to Nigrosine Black-colored solutions. Slight aversion to water solutions containing Brilliant Red and Monastral Fast Green were noted in laboratory rats. The coloring of 1080 with the above-mentioned compounds did not affect adversely the toxicity of the compound. Brilliant Red B Extra dye appears to be a potentiating agent for 1080. Knock down and "time until death" were shortened as a result of the inclusion of this material.

Of the colors employed in this investigation Nigrosine Black (W.S.) dye appears the most effective for the purpose intended. The inclusion of the dye produces a distinctly colored dry 1080 powder; water solutions are black and relatively unattractive to human beings, and it would appear that the efficiency of rodent-control operations would not be impaired in any way.

Recommendations for the inclusion of Nigrosine Black dye and trial runs at the Anniston Plant of Monsanto Chemical Co. have been made. Field studies with the colored 1080 are to be made before definite recommendations for its operational use are formulated. (U.S. Dept. Interior, Fish and Wildlife Service, Wildlife Res. Lab., Denver, Colorado, Report for 3rd Quarter of FY 1948)

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A Dispenser for 1080 Solution: To meet the need in rat-control work for a suitable kit for dispensing 1080 solution, a complete unit has been developed. The dispenser consists of a 3-quart all-rubber battery water jug (commercial type) equipped with a 3 and 1/4 oz. syringe bulb with a delivery tube, a 3-column metal holder for a quantity of 1/2 oz. paper cups, and a flashlight with a mounting-bracket assembly, all compactly assembled as a unit. The jug is conspicuously labeled with the word "poison."

It is believed that the adoption of such a standardized 1080-water dispenser by rodent-control agencies will do much toward preventing the careless use of miscellaneous bottles and other containers and possibly the accidental poisoning of persons or domestic animals. (U.S. Dept. Interior, Fish and Wildlife Service, Wildlife Res. Lab., Denver, Colorado, Report for 3rd Quarter of FY 1948)

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Comparison of the Semi-Rigid Stretcher (NMRI Model A) Now Carried by Most Submarines with the Peters Emergency Stretcher: The object of this study was to determine the suitability of the "Peters Emergency Stretcher" for use aboard submarines.

The Peters unit was compared with the submarine equipment, NMRI Model A, semi-rigid stretcher, in dockside trial. The following criteria were used as a guide.

(a) Security to the patient

1. means of fastening head securely, particularly when stretcher is to be carried on its side.

(b) Ease of handling and hoisting in the vertical position.
(c) Ease of handling and means for hoisting in horizontal position.
(d) Adaptability for the "Eve" Method of resuscitation.
(e) Suitability for back injuries.
(f) Stowage.
(g) Comfort to patient.

Although it was found that the Peters unit was superior in certain minor regards to the NMRI unit, it is considered that for use aboard submarines the NMRI semi-rigid type is superior in its over-all suitability. (BuMed Proj. NM 011 019, Rep. No. 1, 31 Mar '48, Med. Res. Dept., U.S. Sub. Base, New London, Conn. - E. F. Kopecky et al.)

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A Review of Subjective Responses to Vibratory Motion of the Human Body in the Frequency Range 1 to 70 Cycles Per Second: The exposure of human beings to mechanical vibration is often attended by annoyance and discomfort and under certain conditions prolonged exposure may result in permanent injury. It is, therefore, of great importance to have some means of estimating safe exposure limits for personnel. However, there has been very little information available on which to base any statements, partly because the production and measurement of controlled vibration present a serious technical problem, and partly because of the difficulty of establishing valid criteria. Such criteria may be based on subjective response, on specific physiological reactions, or on the production of injuries.

In this study, analysis of measurements of several investigators on subjective responses to mechanical vibration shows that these responses may conveniently be referred to three levels: I. the threshold of perception, II. the threshold of discomfort, and III. the threshold of tolerance.

A set of 3 reference curves of amplitude versus frequency has been obtained, subject to an estimated uncertainty of about one-half a log unit. The shape of these curves appears referable to the combined effects of mechanical resonance of body structures and to the frequency characteristics of the sensory mechanisms involved.

Under certain conditions a cautious application of these reference curves to practical field situations may be made. (Proj. NM 004 001, Rep. No. 1, 16 Mar '48, Nav. Med. Res. Inst., Bethesda, Md. - D. E. Goldman)

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Re Cooperation in National Urban Rat-Control Campaign: The attention of all Medical Department personnel concerned with rodent control is invited to the National Urban Rat-Control Campaign. Cooperation with local agencies prosecuting this campaign is suggested where the national campaign is operating on or adjacent to naval establishments.

The following information concerning the Urban Rat-Control Campaign appeared in the Public Health News of the New Jersey State Department of Health, Volume 29, April 1948:

> The U. S. Department of the Interior, in an effort to reduce food loss from rats has taken the leadership in a National Urban Rat-Control campaign. The immediate aim is a temporary drive supplementing local action and stimulating existing public interest and participation. It is expected that the national campaign will supply momentum to long-range rat-control programs initiated by states and cities.
>
> In a letter to Mayors of all cities over 10,000, the Secretary of the Department of the Interior expressed the following ideas:
>
> In the United States there is an annual loss of a billion dollars' worth of food destroyed or contaminated by rats. We can ill afford to waste this food which is needed abroad, and the salvage of which might mean reduced prices of food in this country.
>
> Knowledge of rat control is useless without active cooperation and participation by the residents of a community. Although the present effort is a short-term program to save food, it should result in long-time gains in better sanitation, rat-proofing and general civic improvements.
>
> It is well known that rats can spread typhus, spirochetal jaundice and other diseases. They are a deadly enemy.

(Preventive Medicine Div., BuMed)

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Basic Science Course Available to Medical Officers: The Bureau of Medicine and Surgery announces the availability of a Basic Science course to be given under the auspices of the Medical Department of the U. S. Army, at the Walter Reed Medical Center, Washington, D. C. The course will be of six months' duration and begin on or about 1 January 1949.

The purpose of this course is to present the fundamental scientific basis of medical practice. Particular stress will be given to biochemistry, physiology, metabolism, and tissue response. This basic science course is recommended

for medical officers who desire to broaden their general medical background, and particularly for residents and prospective residents in internal medicine, surgery, obstetrics, orthopedics, and pediatrics.

BuMed's quota is four places. Requests are desired from medical officers of the regular Navy. No Service agreement is required. Requests must reach BuMed prior to 1 October 1948. (Professional Div., BuMed)

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New Residency in General Practice Open to Naval Medical Officers: The Bureau announces that a residency in General Practice will be inaugurated in naval hospitals on 1 July 1948. The establishment of residencies in this phase of medicine is required to meet the needs of the Naval Service. This new residency, which is general in its scope, supplements the current residency training program, which in design, has been toward specialization in fields represented by the various American Specialty Boards. As planned, this residency will be for three years, during each year of which medical officers will receive six months of training in general medicine and related specialties, and six months in general surgery and related specialties. Instruction will be provided by members of the Naval staffs and by outstanding civilian doctors who compose the visiting staffs of the hospitals.

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Two Courses in Diseases of the Chest: The American College of Chest Physicians has planned for two postgraduate courses on Diseases of the Chest to be given during the month of September, 1948.

One course on diseases of the chest will be given in San Francisco, California, from 13 to 17 September. This course is sponsored by the American College of Chest Physicians in cooperation with the University of California Medical School and Stanford University School of Medicine under the auspices of University Extension, University of California. This will be the first course sponsored by the American College of Chest Physicians in San Francisco. BuMed's quota is eight places.

The other course, the third annual Postgraduate Course on Diseases of the Chest, which will cover all of the newer aspects of chest diaseses, will be presented by nationally known authorities, at the Stevens Hotel, Chicago, Illinois, from 20 to 25 September. This course is sponsored by the Council on Postgraduate Medical Education of the American College. BuMed's quota is five places.

Requests are desired from medical officers of the regular Navy who are interested in the specialties of internal medicine and thoracic diseases. (Professional Div., BuMed)

Industrial Hygiene Newsletter: It has recently been announced that the Industrial Hygiene Newsletter published monthly by the Industrial Hygiene Division of the U. S. Public Health Service has been placed on the list of subscription publications of the U. S. Government Printing Office, Washington, D. C. This publication which is a useful and valuable tool to all whose interests are connected with the field of industrial health now becomes generally available.

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Openings in MSC, USN, by Transfer: Applications are desired from temporary officers and Reserve officers on active and inactive duty for transfer to the regular Navy in the Pharmacy Section, Optometry Section, and the Medical Allied Sciences Section of the Medical Service Corps. See BuPers Circular Letter 48-73 on page 31 for further information.

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Op24B/cj, Serial 189P24 27 April 1948

To: All Ships and Stations

Subj: Establishment of U. S. Naval Dental Technicians School (Class A), Naval Training Center, San Diego, Calif.

1. The following activity is hereby established under an officer in charge:

U. S. Naval Dental Technicians School (Class A)
Naval Training Center
San Diego 33, California 7302-800

This activity is under the military command of the Commanding Officer, Naval Administrative Command, U. S. Naval Training Center, San Diego, California, and is under the management control of the Bureau of Medicine and Surgery.

2. Bureaus and offices concerned take necessary action.

--SecNav

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BuPers Circular Letter 48-73 - Pers-362-AO, P14-2 - 20 April 1948

To: All Ships and Stations

Subj: Request for Applications From Temporary and Reserve Officers for Transfer to the Regular Navy in the Pharmacy Section, Optometry Section, and the Medical Allied Sciences Section of the Medical Service Corps, U. S. Navy

Refs: (a) Public Law 337, 80th Congress, approved 4 Aug 1947.
(b) Alnav 238-47; N. D. Bul. of 15 Nov 1947, 47-1052.
(c) Public Law 347, 79th Congress, approved 18 Apr 1946, as amended.
(d) Change 4 to the Transfer Regulations, approved 10 May 1946.
(e) BuPers Circ. Ltr. 288-45 (revised).
(f) Alnav 587-46; AS&SL July-Dec. 1946, 46-2113, p. 90. .

1. The purpose of this letter is to invite attention to the opportunity offered by references (a) and (b) for qualified Reserve and temporary USN officers to apply for transfer to the Medical Service Corps of the U. S. Navy. The changes to reference (f) made necessary by references (a) and (d) with regard to the categories within the Medical Allied Sciences Branch of the Medical Service Corps to which appointments may currently be made pursuant to reference (c) are reflected herein.

2. Applications are now desired from subject officers who are graduates of an accredited school of pharmacy or optometry or who hold degrees in sciences allied to medicine other than pharmacy or optometry for appointment to commissioned grades in the Medical Service Corps of the Regular Navy for service in one of the following specialized fields: Bacteriology, biochemistry, biophysics, chemistry, entomology, parasitology, physics, physiology, psychology, pathology, pharmacology, public-health medical statistics, sanitation engineering, virology, serology, radiobiology.

3. The applications of interested candidates should be submitted in accordance with reference (e). Commandants or commanding officers shall forward all applications to the Bureau of Naval Personnel (attention Pers 362). Local board interview and report is not required. Age and service requirements are the same as for Medical, Dental, and Hospital Corps officers. The restrictions as to submission of requests within 6 months after release to inactive duty or resignation do not apply, and applications will be considered until a closing date is specified.

4. The Chief of Naval Personnel desires that all commanding officers having eligible personnel under their commands take positive steps to insure that the information contained in this letter is brought to the attention of all individuals who may be eligible for consideration for appointment as stated above, and that all commandants give widest practicable publicity of the provisions of this letter to all reserve officers on inactive duty.

--BuPers. J. W. Roper

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BuPers Circular Letter 48-76 - Pers-5-MGD, P3-1 - 27 April 1948

To: All Ships and Stations

Subj: Command Responsibility in Repression of Venereal Disease

Refs: (a) General Order 225.
(b) General Order 238.
(c) Art. D-9112, BuPers Manual.
(d) Joint BuNav-BuMed ltr, BuMed P3-2/AT12(021-40); BuNav-147-RNC, P3-1(85), of 25 Mar 1941; N. D. Bul. Cum. Ed. 1943, 41-2064, p. 1160.
(e) Joint BuMed-BuPers-MarCorps ltr, BuMed:Y:jk, P11-1/P3-1, Circ. Ltr. 46-5, of 8 Jan 1946; AS&SL Jan.-June 1946, 46-135, p. 733.

1. There has been a 30-percent decrease in the venereal-disease-incidence rate throughout the Navy during the past 12 months. Although the over-all incidence is decreasing, it is still 89 percent greater than at the close of the war. One reason for this is the all too common attitude that venereal disease is no longer a serious problem and that the present treatment has reduced

the number of days lost and complications to a point where they are insignificant. This has resulted in there being a number of individuals who repeatedly expose themselves and thereby account for several admissions to the sick list each year. Through their conduct and group pressure, other individuals are easily swayed and are often misled. Reports received in the Navy Department definitely indicate that incidence rates can be reduced through education.

2. Venereal-disease control is a command responsibility. It is a function of command to impress moral responsibility and encourage self-discipline in the personnel of the Naval Establishment.

3. Through education, the men should continually be impressed with their moral responsibility and it should be made clear that continence is not incompatible with health and the fullest degree of physical and mental vigor. It is felt that this program is successful in a large percentage of naval personnel; however, increased efforts must be directed toward "repeaters." Individuals in this category demonstrate willful indifference or careless neglect of elementary measures of self-protection and are of little value to the Navy. With these facts, the following recommendations are made in amplification of the above references, for the consideration of the commanding officer:

(A) Suitable disposition or discharge in the cases of personnel who by the example of their private lives exhibit disregard for moral principles, undermine discipline, or demonstrate undesirable habits and traits of character by repeated incurrence of venereal disease.

(B) Make available in the regular training schedule periods for weekly lectures on citizenship and morality, such that all personnel of the command attend. It is suggested that coordinated lectures or talks be given in rotation by the more senior officers of the command. It is considered important that arrangements be made in those commands not having a chaplain or medical officer attached for lectures by visiting chaplains on the moral and religious aspects of sex conduct and by medical officers on sex hygiene and venereal diseases.

(C) Encourage and provide maximum facilities for athletic and other wholesome recreation within the command.

(D) Arrange with the medical officer to keep the commanding officer informed of venereal-disease incidence and of repeated infections in individuals within the command.

(E) Have the medical officer recommend suitable periods of on-board retention for observation in the case of each individual treated for a venereal disease who in the medical officer's opinion requires such retention for the protection of his own as well as the public health. Extreme care shall be exercised in administering this requirement to insure that it is not utilized as a form of punishment.

(F) Have the medical officer and the chaplain arrange to give instruction to smaller groups and individuals as, for example, new drafts before their first liberty, and individuals whose medical records show previous venereal infection.

4. It is considered important that renewed and continuous attention be given to the development of leadership throughout all echelons in combating the conditions which have resulted in the present venereal-disease problem. Special emphasis must be placed on the development of a sense of responsibility in petty officers.

5. Attention is invited to the fact that specially trained venereal-disease-control officers are stationed at headquarters naval districts, river commands, fleet commands, and large shore stations. These officers are available to assist in the venereal-disease-control program.

--BuPers. T. L. Sprague

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ALNAV 38

17 May 1948

Subj: Dangerous Intravenous Solutions

In view present publicity re dangerous intravenous solutions attention invited AlNav 80-47. Without regard to manufacturer or description dangerous solutions grossly detectable by presence of visible particles or growth.

--SecNav

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Circular Letter 48-55 - This letter is classified as "Restricted." See Navy Department Bulletin of 15 May 1948 for copy.

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Circular Letter 48-56

14 May 1948

To: NavHosps

Subj: Applications for Automobiles Under Public Law 663, 79th Congress, Information Relating Thereto

Ref: (a) Public Law 663, 79th Congress, Title I, as extended.

This letter contains information and instructions in connection with reference (a) (authority for the Administrator of Veterans' Affairs to provide an automobile or other conveyance to World War II veterans having certain types of disability), the provisions of which were extended to 30 June 1948 by Public Law 161, 80th Congress.

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Circular Letter 48-56A Joint Letter 14 May 1948

To: All Ships and Stations

Subj: Aviation Selection Tests, Modification of Requirements Concerning

1. Effective this date all applicants for flight training, officer, enlisted and civilian, will be required to obtain the following scores on the Flight Aptitude Rating Tests: ACT, C; MCT, C; FAR, C.

2. All previous instructions in conflict with this requirement are hereby modified.

--BuMed C. A. Swanson --BuPers J. W. Roper

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Circular Letter 48-57 17 May 1948

To: Ships and Stations Having a Representative of the Medical Department Aboard

Subj: Fiftieth Anniversary of the Hospital Corps

This letter (1) states that it is desired that 17 June 1948, the 50th Anniversary of the establishment of the Hospital Corps, be observed as "Hospital Corps Day" throughout all Medical Department activities and (2) gives suggestions for commemorating "Hospital Corps Day" locally and for cooperating with the local public relations representative and the local press and/or radio.

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Circular Letter 48-58 Joint Letter 24 May 1948

To: All Ships and Stations

Subj: Polluted Overboard Water in Harbors, Lagoons, Open Seas, Inland Streams and Other Contaminated Areas; Hazards to Naval Personnel of

Refs: (a) CNO Ltr Op-411K/meg/mls FS/S37, Ser 137P411 dtd 25 Feb 1948.
(b) Article 1324, U. S. Navy Regulations 1920.
(c) OPNAV Ltr Op-23-2-MM, Ser 211523 dtd 28 May 1945.

1. Due to the potential health hazards to naval personnel of operations in polluted water areas, Reference (a) directs the formulation of instructions concerning the correction of sanitary hazards which may exist.

2. The indiscriminate use of water in subject areas into which raw sewage from ships, military establishments, or municipalities, is emptied presents constant hazards to the health of naval personnel. Investigations have shown that there exists among personnel aboard certain ships of the Fleet an appreciable number of carriers of Shigella micro-organisms who at varying intervals excrete in their feces increased numbers of these bacteria. Further, investigations have shown that under certain circumstances the micro-organisms (Shigella and Salmonella) causing diarrheal disease (bacillary dysentery and gastro-enteritis) can be recovered from certain overboard waters. In addition, studies show that pollution of open sea water is increased by discharge of raw sewage from ships under certain conditions of ship formations.

3. The results of these investigations emphasize the necessity for strict compliance with references (b) and (c). Reference (b) restricts the use of harbor water under conditions of contamination with sewage in order to reduce, as much as possible, the occurrence of epidemics which not only cause individual suffering, but also may result in a situation where the personnel are unable to operate the ship. Reference (c) outlines the hazards involved and the special precautionary measures to be taken when it becomes necessary to connect a potable-water system ashore to a ship's fire and flushing system. It should be noted that although separate potable and fire protection connections may be installed, these systems frequently have a common source of supply at a point remote from the local outlet connections. The greatest risk to health of the crew is the use of polluted overboard water in harbors, lagoons, inland streams, or other contaminated areas for such purposes as the following and shall be prohibited:

(a) Vegetable locker and preparation room
(b) Washing or rinsing utensils, apparatus, or containers used for food or in its preparation
(c) Scrubbing mess tables
(d) Oral hygiene

Other uses of this water which may not be of as great risk as the above, but may serve as an indirect mode of infection and should be reduced to a minimum are:

(a) Scrubbing decks
(b) Scrubbing clothing

(c) Showers
(d) Any other purpose involving close contact of polluted water with naval personnel such as fire drill, wetting down decks and bulkheads, etc.

Even in the open sea when ships are in formation contamination of the water may result to such an extent as to render the use of overboard water for the above purposes undesirable due to possible danger to health of the crew. This is particularly true when the distance between ships is less than one thousand (1000) yards.

4. Suitable precautions, by the use of tarpaulins or other satisfactory covering, shall be taken to prevent salt water spray from reaching raw vegetables, and other stores intended for consumption without cooking, in transit on vegetable barges or other conveyance in polluted waters.

5. Commanding officers shall take the necessary action to insure that while in polluted areas all salt water lines to galleys, pantries, other places where food is prepared or handled, and wash basins and showers, are secured.

6. Certain precautions are necessary in the operation of evaporators in polluted waters to obviate the possibility of an outbreak of water-borne disease. Strict compliance with instructions contained in Chapter 58, Distilling Plant, Bureau of Ships Manual is essential.

7. Measures shall be instituted to provide clear differentiation between dockside and ship connections for salt and fresh water lines used for taking water on board. Under no conditions shall the use of fresh water hose or lines be permitted for conveying salt water or polluted fresh water. Special supervision shall be provided to prevent infractions of this provision.

8. Before taking water aboard for drinking or culinary purposes from dockside connections, water barges or other conveyances, commanding officers shall require proof of the potability and bacteriologic safety of such water. If such proof is not available, the water shall be tested for salinity and chlorinated before use as drinking water.

9. Swimming in overboard water shall be permitted only after consultation with the medical officer.

10. Personnel operating open boats, particularly when stationed at the stern, are frequently subjected to thorough drenching by salt water spray and thereby are placed in a situation similar in hazard to swimming overboard in polluted areas. Others such as line handlers and special duty groups may be exposed to salt water or salt water spray in carrying out their tasks. It is realized that protection in many instances is difficult of attainment so that commanding officers are enjoined to apprise personnel of this hazard, in their instructional

training, and the importance of thorough washing of the hands and face after exposure to salt water spray as well as the importance of not eating during the time of such exposure and prior to thorough washing of the hands.

--BuMed. C. A. Swanson --BuShips. H. E. Haven

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Circular Letter 48-59 26 May 1948

To: Medical Officers in Command, U. S. Naval Hospitals; National Naval Medical Center, Bethesda; U. S. Naval Medical Center, Guam.

Subj: Hospital Atlases

Encl: 1. (HW) Copies of Parts I, II, and III of BuMed Hospital Atlases

1. The Bureau of Medicine and Surgery has developed for use in the Bureau a set of atlases which contain summary information on the history, distinctive functions, capacity, complement, physical facilities, organization, and professional services of each naval hospital.

2. The general character and arrangement of these atlases is illustrated by those exhibited and described at the Symposium of the Surgeon General at the National Naval Medical Center, 27, 28 and 29 May 1948.

3. The Bureau anticipates that each hospital will develop its own version of the atlas for local use. More than one copy may be found desirable in the larger hospitals.

4. The principal uses of the hospital atlases will be:

(a) To familiarize officers assigned to the Bureau of Medicine and Surgery, as well as newly assigned officers and visitors in the hospitals themselves, with the historical background and facilities of each naval hospital.

(b) To provide readily available current information on such matters as bed capacity, complement, alterations in or additions to physical plant, and statistical summaries of professional services rendered to different types of patients.

(c) To aid the Bureau of Medicine and Surgery in analyzing and planning the location and mission of the various naval medical activities, in cooperation with the other armed services, other federal health agencies, and civilian medical organizations.

(d) To assist the Surgeon General and his staff in acquainting key officials, boards, and offices with the nature, capabilities, and needs of naval hospital facilities.

5. The enclosures are provided herewith to each medical officer in command as a matter of information. These write-ups have been prepared from information available in the Bureau. However, it is anticipated and requested that each hospital redraft and improve these statements for local use in their own atlases. It is further requested that the Bureau be provided copies of all such redrafts for use in the volumes maintained in the Bureau.

6. It is requested that the following further steps in developing the atlases be taken by all medical officers in command to complete the atlases already compiled and maintained in the Bureau:

(a) Provide better or more photographs of each hospital and its professional activities.

(b) Provide summary information on civilian consultants serving at each hospital and on methods of cooperation with local civilian health agencies.

(c) Assemble a full list of medical officers in command, with dates of service, from date of the hospital's commissioning to the present, to round out the historical data already compiled.

(d) Furnish current copies of any hospital newspaper or bulletin now being published.

(e) Furnish copies of all summaries and statements used in each local hospital atlas.

7. It is intended that the main categories of information on each hospital will be kept up to date in the atlases through the use of data from periodic reports already required by existing regulations and instructions.

--BuMed. C. A. Swanson

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Circular Letter 48-60 27 May 1948

To: MedOfCom, U.S. Naval Hospitals (Continental U.S.); U. S. Naval Medical Supply Depots (Continental U.S.); National Naval Medical Center, Bethesda, Maryland

Subj: Sunday Holidays

Refs: (a) NCPI 85.5 (Rev I) as amended.
(b) NCPI 250.7-13 (Rev II) as amended.

This letter contains information and instructions concerning the rules and regulations governing pay and leaves of absence in instances when a holiday falls on a Sunday.

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ALNAV 39

19 May 1948

Subj: Re Separation of Reserve Medical and Dental Officers

Naval Reserve medical and dental officers serving two-year obligated terms on active duty under AlNavs 281-46 and 556-46 who recently received individual letters from BuPers advising them of their possible retention on active duty beyond the completion of their obligated service are hereby notified that they will be separated not later than originally scheduled. Officers on duty with the Veterans Administration will be authorized early separation by the amount accrued but unused leave standing to their credit. Requests for separation (or early separation by the amount of leave credit) not required. BuPers sending individual separation orders all officers concerned.

--SecNav

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